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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/761,765

01/21/2004

Christopher Charles Williams

3051U.001

2873

21917 7590 04/04/2008  
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EXAMINER

BAREFORD, KATHERINE A

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

04/04/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/761,765

**Applicant(s)**WILLIAMS, CHRISTOPHER  
CHARLES**Examiner**

Katherine A. Bareford

**Art Unit**

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4 and 6-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

The amendment to the specification of January 24, 2008 (in response to the notice of non-compliant amendment of January 18, 2008) has been received and entered. The amendment to the claims of April 20, 2007 (filed with the petition to revive) has been received and entered.

With the entry of the amendments, claim 5 is canceled, and claims 1-4 and 6-10 (including new claims 9-10) are pending for examination.

The Examiner notes the petition decision of November 16, 2007 granting the petition to revive the application.

### *Specification*

1. The objection to the disclosure because of the following informalities: (1) at page 4, line 1, "peeing" should apparently be "peening". (2) At page 11, line 6, after "form a" a ")" is needed. (3) at page 16, line 2, the units of residual stress "5n to 20n" are different than that used in the claims (N rather than n) is withdrawn, due to the corrections made as to these issues in the amendments to the specification of January 24, 2008.

2. The amendment filed January 24, 2008 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no

amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

(1) the entire amendment inserted at page 3, between lines 6-7, consists of new matter. The disclosure as originally filed provides no support for these problems of inlet fogging and water injection, and applicant has pointed out no basis for the support.

(2) The amendment to the paragraph beginning at page 3, line 14, "However, if a great depth of compressive stress penetration is not required then shot peening is acceptable." is new matter. The disclosure as originally filed provides no support for this statement as to Prevey, and applicant has pointed out no basis for the support.

(3) In the amendment to the paragraph beginning at page 11, line 1, the amendment to add "Eddy Current" to acceptable inspection techniques is new matter. The disclosure as originally filed provides no support for this inspection method, and applicant has pointed to no basis for the support.

(4) In the amendment to the paragraph beginning at page 12, line 7, replacing "level" with "depth and magnitude" as to the residual compressive stresses is new matter. The disclosure as originally filed provides no support for these changes, and applicant has pointed to no basis for the support. As well, the material added as to the AMS 2430 test method, "AMS 2430 process using . . . standard unit of measure." is new matter. The disclosure as originally filed provides no support for this inspection

method, and applicant has provided no showing that the originally described using of "AMS 2430" specifically means that every feature as described is present.

(5) The amendment to the paragraph beginning at page 15, line 15, to indicate that "the desired residual compressive stress, between 5N to 20N, which approximates the proportional limit of the material of the blade or component." is new matter. The disclosure as originally filed provides no support for these changes, and applicant has pointed out no basis for the support. As previously noted in the Office Action of March 11, 2005 (paragraph 3), stress is measured in units of force per unit area, and Newton, "N" does not provide stress units, and thus this would not indicate actual stress. Furthermore, there was no previous mention of proportional limits and how it is related to stress or force units. Furthermore, the addition that the peening can be "water jet peening" is new matter. The disclosure as originally filed provides no support for this peening method, and applicant has pointed out no basis for the support. Furthermore, the addition that the trailing edge is masked to "reduce the depth of residual compressive stress to this portion of the airfoil" rather than "avoid imparting residual compress stress to this portion of the airfoil" is new matter. The disclosure as originally filed provides no support for this change, and applicant has pointed out no basis for the support.

Applicant is required to cancel the new matter in the reply to this Office Action.

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-4 and 6-10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

(1) the April 20, 2007 amendment to claim 1, step i) to provide "impart a residual compressive stress which approximates the proportional limit of the material of the blade or component" is new matter. The disclosure as originally filed provides no support for the stress being such that it approximates the proportional limit of the material of the blade or component. Any references to this were provided in the amendment to the specification of January 24, 2008 (and are also new matter, as discussed in the **Specification** section above). Applicant has provided no indication of where basis for this material was previously provided.

(2) the April 20, 2007 amendment to claim 1, step iii) to indicate that "the total thickness of all the layers is generally between 3 microns to 30 microns" is new matter. The disclosure as originally filed provides no basis for this requirement, and applicant has not indicated where any basis is provided.

(3) the April 20, 2007 amendment to claim 4, step g) to provide "impart a residual compressive stress which approximates the proportional limit of the material of the blade or component" is new matter. The disclosure as originally filed provides no support for the stress being such that it approximates the proportional limit of the material of the blade or component. Any references to this were provided in the amendment to the specification of January 24, 2008 (and are also new matter, as discussed in the **Specification** section above). Applicant has provided no indication of where basis for this material was previously provided.

(4) the April 20, 2007 amendment to claim 4, step i) to indicate that "the total thickness of all the layers is generally between 3 microns to 30 microns" is new matter. The disclosure as originally filed provides no basis for this requirement, and applicant has not indicated where any basis is provided.

(5) new claim 9, provided in the amendment of April 20, 2007, contains new matter, as the disclosure as originally filed does not provide this inspection step for new blades or components. Applicant has not indicated where any basis is provided.

The other dependent claims do not cure the defects of the claims from which they depend.

5. Claims 1-4 and 6-10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to

which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In claim 1, part i) and claim 4, part g, with the amendment of April 20, 2007, the airfoil is to be cold worked to impart a “residual compressive stress which approximates the proportional limit of the material of the blade or component”. There is no description of this “proportional limit” in the specification other than the material added with the amendment of January 24, 2008, to the paragraph beginning on page 15, line 15, which provides that “. . . selected surfaces of the airfoil are cold worked so as to obtain the desired residual compressive stress, between 5N to 20N, which approximates the proportional limit of the material of the blade or component.” However, stress is measured in units of force (such as Newton, N) per unit area (such as meters squared –  $m^2$ ). It is unclear from a reading of the specification and claims as originally filed as to what compressive stress is actually used given the use of N, which does not provide stress units. As a result, since the only description of proportional limits uses a description of stress that does not provide understandable units or measurements, one of ordinary skill in the art would not be able to make and/or use the invention without performing undue experimentation to determine what stress and proportions are actually acceptable. As well, it is unclear what a “proportional limit” is in regard to residual compressive stress. Is it a stress itself? Is it some other unit?

The other dependent claims do not cure the defects of the claims from which they depend.



6. The rejection of claims 1-8 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention is withdrawn due to the clarifying amendments of April 20, 2007.

*Claim Rejections - 35 USC § 103*

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 1-4 and 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gupta et al (US 4904528) in view of Cretella et al (US 4028787), Bergmann et al (US 5238546) and Paidassi et al (US 5702829).

Gupta teaches a method of protecting the gas turbine engine components, such as blades and vanes. Column 1, lines 5-20. Since the parts are to be fabricated, they would be unused. Column 1, lines 5-20. The surface of the component is cold worked by shot peening to have a controlled residual surface compressive stress of 50 to 100 ksi. Column 5, line 55 through column 6, line 15 (given the confusion as to what amount of residual stress is desired, as discussed in the 35 USC 112, 1<sup>st</sup> paragraph rejection above,

it is the Examiner's position that the range of stresses provided by Gupta would read on that claimed, including the proportional limits). After cold working, a coating of essentially titanium nitride (TiN) is applied to the component. Column 1, line 60 through column 2, line 35. The coating is applied by a vapor deposition process that can be a cathodic arc deposition. Column 2, lines 5-30. The coating thickness can be 10 to 25 microns. Column 2, lines 20-25.

Claim 2, 7: the alloying elements of aluminum, cobalt and nickel are not required to be present, as claims 1 and 4 provide for the presence of TiN without alloy materials.

Claim 3, 8: the cold working can be by shot peening. Column 6, lines 1-10.

Gupta teaches all the features of these claims except (1) the cleaning step ii and h, (2) the temperature of deposition of step iii) and i, (3) the layers of different hardness of step iii) and i, (4) the repair and all repairing steps (claim 4), (5) the inspection steps (claims 9 and 10) and (6) the peening step with ceramic bead peening (claim 6).

However, Cretella teaches that it is desired to recover and repair used gas turbine engine components such as vanes. Column 1, lines 10-30. In the process the vanes are first cleaned and degreased. Column 4, lines 1-6 (steps 1 and 2). Then they are inspected. Column 4, lines 5-10 (see step 3). They are also inspected by fluorescent penetrants. Column 4, lines 5-10 and 49 (steps 4, 14). Cracks and other defects are repaired by welding and building up. Column 4, lines 10-25 (steps 7-9). The surface is cleaned and conditioned and a shot peening operation can occur. Column 4, lines 25-30 (step 10). The blade is then coated. Column 4, lines 25-40 (step 11). The finished blade is

inspected for accuracy of dimension. Column 4, lines 45-55 (step 17). While Cretella does not provide all the treatment steps in the same order as in claim 4, the claim does not require the sequential provision of the steps.

Bergmann teaches a process for the cathodic arc deposition of TiN. Column 6, lines 30-65. The process can occur at a temperature such that the process temperature did not exceed 222 degrees C. Column 8, lines 30-60.

Paidassi teaches providing a protective coating on a component of a gas turbine, such as a blade. Column 1, lines 10-20. Paidassi teaches that the layers have different hardness and allow for erosion and cracking protection. Column 5, lines 15-40 and column 7, lines 10-15. The layers can be applied by a cathodic deposition. Column 5, lines 50-65. The total thickness of the layers can be 5-200 microns. Column 8, lines 10-20.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Gupta to repair turbine blades and to perform cleaning between the shot peening and the coating (whether on new or repaired blades) as taught by Cretella in order to provide a desirable coated blade product, because Gupta teaches a desirable protective coating of TiN to be applied to turbine blades and Cretella teaches that it is desirable to repair and reuse turbine blades and to clean blades before coating treatments, which would apply to new or repaired blades. It would further have been obvious to modify Gupta in view of Cretella to optimize the temperature of the deposition of the coating by routine experimentation, because Bergmann teaches

that when using cathodic deposition to deposit TiN, it is known to use a temperature no higher than 222 degrees C. It would further have been obvious to modify Gupta in view of Cretella and Bergmann to provide the coating made up of layers of TiN of different hardness as suggested by Paidassi to provide a component protected under various conditions, because Gupta in view of Cretella and Bergmann teaches to protect a turbine component with TiN and Paidassi teaches that when protecting a turbine component, providing different layers of different hardness provides for optimum protection of the component. It would further have been obvious to modify Gupta in view of Cretella, Bergmann and Paidassi to use the inspection step of claims 9 and 10 and the peening of claim 6 with an expectation of having desirable inspection and peening, because Cretella teaches the desire to inspect turbine blades to be repaired using a fluorescent inspection and also teaches the conventional inspection of the finished blade for accuracy of dimension, which would include testing the thickness of the coating, and this desire for accurate articles would apply to new and used blades; and further because Gupta teaches the desire to shot peen to provide a controlled range of residual stress and one of ordinary skill in the art would use a well-known method of peening including using ceramic particles of claim 6 in order to provide controlled achievement of residual stress.

*Response to Arguments*

9. Applicant's arguments filed April 20, 2007 have been fully considered but they are not persuasive.

As to applicant's arguments that the cited references do not teach or suggest the cold working to impart a residual compressive stress which approximates the proportional limit of the material of the blade or component, the Examiner notes as discussed in the 35 USC 112, first paragraph rejection above, one of ordinary skill in the art would be unable to determine the proportional limit requirements from applicant's description, and thus from the limited information available, it appears that Gupta would read on the claimed amount of stress. The bare statement by applicant's attorney that "Gupta et al. teach imparting a residual compressive stress of 50 to 100 ksi which is not the proportional limit of the material of the blade or component" is simply an attorney argument, and does not rise to the level of evidence on the record required to rebut a prima facie case of obviousness. See MPEP 2145.I, "The arguments of counsel cannot take the place of evidence in the record. In re Schulze, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965); In re Geisler, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997) ("An assertion of what seems to follow from common experience is just attorney argument and not the kind of factual evidence that is required to rebut a prima facie case of obviousness.")." Also see MPEP 716.01(c), I, "Objective evidence which must be factually supported by an appropriate affidavit or declaration to be of probative value includes evidence of unexpected results, commercial success, solution of a long-felt need, inoperability of the prior art, invention before the date of the reference, and

allegations that the author(s) of the prior art derived the disclosed subject matter from the applicant. See, for example, *In re De Blauwe*, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984)" (emphasis added).

As to applicant's argument that Gupta recognizes that their process is useless in gas turbine applications, and would in fact be detrimental, the Examiner disagrees. Gupta's entire process is directed to coatings for protecting gas turbine engine components (see column 1, lines 5-10), and therefore the actual process of Gupta would, of course, apply to gas turbine applications. The teaching at column 5, lines 58-65, or more precisely, at column 5, line 58 through column 6, line 3, is to indicate that the coating apparatus used can be used to apply other coatings that are not within the claimed requirements of Gupta's TiN coating, with the desirable residual stress. See also claim 1. Gupta certainly does not teach that his own invention does not work.

As to applicant's argument that if Gupta were modified as discussed by Cretella, plasma spraying and sintering would occur, the Examiner disagrees. These are coating processes different than Gupta, and the modification would be to use the Gupta coating in a repair process, with the obvious refinishing and inspecting.

### *Conclusion*

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Katherine A. Bareford/  
Primary Examiner, Art Unit 1792